

Claims

1. A piston mechanism with diverging pistons comprising a crankcase with a crankshaft, a cylinder with inlet and outlet openings and at least two pistons of opposite directions of movement, and connecting members interacting with three crankpins of the crankshaft, wherein one of the connecting members is joined with a middle crankpin and the other is joined with two outer crankpins, wherein at least one piston is firmly attached to connecting rods, which are rigidly fastened to one of the connecting members by their bases and are positioned in guide channels provided in the cylinder body parallel to its axis, forming a synchronous group of connecting rods with a direction of movement corresponding to said connecting member, characterized in that the cylinder additionally comprises connecting rods which are firmly attached to at least one piston of opposite direction of movement, and by their bases are attached to the other connecting member, and are positioned in additional guide channels formed in the body of the cylinder parallel to known guide channels in alternating sequence with them, forming another synchronous group of connecting rods with a direction of movement corresponding to the other connecting member, wherein all guide channels are provided with through-cuts in the working surface of the cylinder with outlets into its cavity so that lateral faces of the connecting rods of the synchronous groups of the different directions facing the cavity of the cylinder form movable parts of its working surface, wherein the pistons are sequentially attached by their peripheries to the lateral faces of the connecting rods of the different synchronous groups, forming working chambers between them.
2. A piston mechanism according to claim 1, characterized in that the connecting members are disposed between the crankshaft and the piston adjacent to it.

3. A piston mechanism according to claim 2, characterized in that the connecting members have the form of an inner and - with a central opening - an outer connecting member for free movement within one another so that the outline of the inner connecting member repeats the outline of the central opening of the outer connecting member.
4. A piston mechanism according to claim 3, characterized in that the inner connecting member has the form of two plates joined to one another, a lower plate with a stand and an upper plate with radial cuts around the periphery for the connecting rod of the synchronous group of this connecting member, attached to the lower plate by their bases, and with recesses between the connecting rods in both plates for the connecting rods of the other synchronous group.
5. A piston mechanism according to claim 3, characterized in that the outer connecting member has the form of two multi-faceted plates rounded to an oval at their tops and attached to one another with the central opening, the lower plate having two diametric stands and the upper plate having radial cuts around the outline of the central opening for the connecting rods of the synchronous group of this connecting member attached to the lower plate by their bases and with recesses between the connecting rods in both plates for the connecting rods of the other synchronous group.
6. A piston mechanism according to claim 4, characterized in that the inner connecting member is joined with a middle crankpin of the crankshaft.
7. A piston mechanism according to claim 5, characterized in that the outer connecting member is joined with two outer crankpins of the crankshaft.
8. A piston mechanism according to claim 6, characterized in that the inner connecting member is joined with the middle crankpin of the crankshaft through a central crank-hinge frame.

9. A piston mechanism according to claim 7, characterized in that the outer connecting member is joined to the outer crankpins of the crankshaft through lateral crank-hinge frames.
10. A piston mechanism according to claims 8 or 9, characterized in that the central and lateral crank-hinge frames each have the form of a separable rectangular outline with a stand and a slide bar arranged within the outline for free translational movement engaging with the corresponding crankpin of the crankshaft.
11. A piston mechanism according to claim 10, characterized in that the stand of the central crank-hinge frame is joined with the stand of the inner connecting member via a pin.
12. A piston mechanism according to claim 10, characterized in that each of the stands of the lateral crank-hinge frames is joined with the corresponding stand of the outer connecting member via a pin.
13. A piston mechanism according to claim 10, characterized in that the central and lateral crank-hinge frames are disposed between the guide plates arranged in the crankcase.
14. A piston mechanism according to claim 6, characterized in that the inner connecting member is joined with the middle crankpin of the crankshaft via a central link.
15. A piston mechanism according to claim 7, characterized in that the outer connecting member is joined with the outer crankpins of the crankshaft through lateral links.
16. A piston mechanism according to claim 14, characterized in that the central link is joined with the stand of the inner connecting member via a pin.

17. A piston mechanism according to claim 15, characterized in that each of the lateral links is joined with the corresponding stand of the outer connecting member via a pin.
18. A piston mechanism according to claim 1, characterized in that three protrusions for attaching the pistons of one direction of movement are formed on the lateral faces of the connecting rods of the synchronous group of the inner connecting member facing the cavity of the cylinder.
19. A piston mechanism according to claim 1, characterized in that two protrusions for attaching the pistons of the opposite direction of movement are formed on the lateral faces of the connecting rods of the synchronous group of the outer connecting member facing the cavity of the cylinder.
20. A piston mechanism according to claim 18 or 19, characterized in that the protrusions on the connecting rods of the synchronous group of the outer connecting member are arranged between the protrusions on the connecting rods of the synchronous group of the inner connecting member.
21. A piston mechanism according to claim 18 or 19, characterized in that the protrusions on the connecting rods of one synchronous group are provided at equal distance to one another which is equal to the distance between the protrusions on the connecting rods of the other synchronous group.
22. A piston mechanism according to claims 18 or 19, characterized in that the protrusions on the connecting rods of both synchronous group are widen, increasing the area of their cross section.
23. A piston mechanism according to claim 1, characterized in that shoulders for the guide channels are arranged on the wide faces of the connecting rods of both synchronous group from the side of their lateral faces which are furthest away from the axis of the cylinder.

24. A piston mechanism according to claim 23, characterized in that the shoulders are continuous.
25. A piston mechanism according to claim 23, characterized in that the shoulders are interrupted.
26. A piston mechanism according to claim 23, characterized in that the width of the wide faces of the connecting rods of both synchronous groups exceeds the thickness of these connecting rods more than twofold in radial direction without considering the shoulders.
27. A piston mechanism according to claim 1, characterized in that the cross section of the connecting rods corresponds to the cross section of the guide channels.
28. A piston mechanism according to claim 1, characterized in that the connecting rods are arranged in the guide channels with a gap of less than 0,02 mm.
29. A piston mechanism according to claim 18 or 19, characterized in that the pistons are provided with annular engaging grooves for the protrusions of the connecting rods of the synchronous groups.
30. A piston mechanism according to claim 1, characterized in that the pistons are provided with annular grooves for sealing rings.
31. A piston mechanism according to claim 1, characterized in that the pistons are shortened.
32. A piston mechanism according to claim 18 or 19, characterized in that the pistons are additionally attached to the protrusions of the connecting rods of both synchronous groups by bolts.

33. A piston mechanism according to claim 1, characterized in that the guide channels for the connecting rods of both synchronous groups cover the entire length of the working cylinder.
34. A piston mechanism according to claim 1, characterized in that the guide channels for the connecting rods of the synchronous groups are shortened.
35. A piston mechanism according to claim 1, characterized in that the guide channels have a T-shaped cross section profile.
36. A piston mechanism according to claim 1, characterized in that the guide channels for the connecting rods of the different synchronous groups alternate with each other by one channel.
37. A piston mechanism according to claim 1, characterized in that the guide channels for the connecting rods of the different synchronous groups alternate with each other by two channels.
38. A piston mechanism according to claim 1, characterized in that in the cylinder body at equal distances from one another the guide channels are formed.
39. A piston mechanism according to claim 1, characterized in that the through-cuts in the guide channels cover their entire length.
40. A piston mechanism according to claim 1, characterized in that the inlet and outlet openings are located in the middle sections of the working chambers formed by two diverging pistons.
41. A piston mechanism according to claim 40, characterized in that the working chambers are formed by diverging pistons and are equal in height.

42. A piston mechanism according to claim 1, characterized in that a working chamber formed by one outer piston is two times smaller in height than the working chambers formed by the diverging pistons.
43. A piston mechanism according to claim 1, characterized in that the inlet and outlet openings are arranged in the upper part of the working chamber formed by one outer piston.
44. A piston mechanism according to claims 1, characterized in that the inlet and outlet openings are formed in spaces between guide channels.
45. A piston mechanism according to claim 1, characterized in that the cylinder is provided with an adjustable lid arranged on the crankcase.
46. A piston mechanism according to claims 1, characterized in that the crankcase comprises technical apertures.
47. A piston mechanism according to claims 1, characterized in that the cylinder is provided with a lid.
48. A piston mechanism according to claims 1, characterized in that the cylinder is provided with spark plugs in the working chambers.